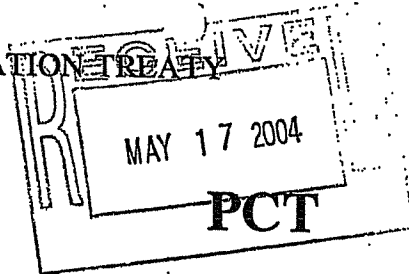


PATENT COOPERATION TREATY



From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
ARLES A. TAYLOR
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DURHAM, NC 27707

WRITTEN OPINION

(PCT Rule 66)

Applicant's or agent's file reference		Date of Mailing (day/month/year) 14 MAY 2004
297/119 PCT		REPLY DUE within 1 months/days from the above date of mailing
International application No. PCT/US02/23174	International filing date (day/month/year) 22 July 2002 (22.07.2002)	Priority date (day/month/year) 20 July 2001 (20.07.2001)
International Patent Classification (IPC) or both national classification and IPC IPC(7): C12Q 1/68; C12P 19/34; c12M 1/34; C07H 21/02, 21/04, 19/00 and US Cl.: 435/6, 91.1 91.2, 287.2; 536/ 22.1, 23.1, 24.3, 24.31, 24.32, 24.33		
Applicant NORTH CAROLINA STATE UNIVERSITY		

1. This written opinion is the first (first, etc.) drawn by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I. ☒ Basis of the opinion
 - II. ☐ Priority
 - III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV. ☐ Lack of unity of invention
 - V. ☒ Reasoned statement under Rule 66.2 (a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI. ☐ Certain documents cited
 - VII. ☐ Certain defects in the international application
 - VIII. ☐ Certain observations on the international application
3. The applicant is hereby invited to reply to this opinion.

When? See the time limit indicated above. ~~The applicant may, before the expiration of that time limit, request this Authority to grant an extension. See rule 66.2(d).~~

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 20 November 2003 (20.11.2003)

Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer <i>Valerie Bell-Harris</i> Jeffrey Slew Telephone No. 571-272-1600
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Form PCT/IPEA/408 (cover sheet) (July 1998)

DOCKET DATES: N/A - Abandoned
 ASSIGNED ATTY: AATL/CPP
 FILE NO. 297/119 PCT
 DOCKETED BY: HMD
 DATE: 5/18/04

WRITTEN OPINION

International application No.

PCT/US02/23174

I. Basis of the opinion

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☒ the description:
 - pages 1-72, as originally filed
 - pages NONE, filed with the demand
 - pages NONE, filed with the letter of _____
- ☒ the claims:
 - pages 73-76, as originally filed
 - pages NONE, as amended (together with any statement) under Article 19
 - pages NONE, filed with the demand
 - pages NONE, filed with the letter of _____
- ☒ the drawings:
 - pages 1-20, as originally filed
 - pages NONE, filed with the demand
 - pages NONE, filed with the letter of _____
- ☐ the sequence listing part of the description:
 - pages NONE, as originally filed
 - pages NONE, filed with the demand
 - pages NONE, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

WRITTEN OPINION

International application No.
PCT/US02/23174

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims <u>1-27</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-27</u>	NO
Industrial Applicability (IA)	Claims <u>1-27</u>	YES
	Claims <u>NONE</u>	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-27 lack an inventive step under PCT Article 33(3) as being obvious over Mirkin et al (WO 01/00876 4 January 2001).

Mirkin et al teach a method of detecting using probes with nanoparticles on a substrate (see whole doc. esp. page 35) They teach gold nanoparticles (see page 61). They teach detecting through conduction (see abstract). They teach indium tin oxide solid surfaces (see page 24). They teach fluorescence detection using light (see

Mirkin et al do not explicitly teach photoelectrochemical detection.

One of ordinary skill in the art would have been motivated to apply light to Mirkin et al's probes in order to detect the conduction of target analyte.

NEW CITATIONS

WRITTEN OPINION

International application No.
PCT/US02/23174

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

TIME LIMIT:

The time limit set for response to a Written Opinion may not be extended. 37 CFR 1.484(d). Any response received after the expiration of the time limit set in the Written Opinion will not be considered in preparing the International Preliminary Examination Report.